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EXAMINER

LEVITAN, DMITRY

ART UNIT

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	Application No. 10/623,919	Applicant(s) SHAKE ET AL.	
	Examiner Dmitry Levitan	Art Unit 2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 10 January 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

Amendment, filed 1/10/08, has been entered. Claims 1-14 remain pending.

*Specification*

In light of Applicants remarks, the objection to the disclosure has been withdrawn.

*Claim Rejections - 35 USC § 112*

1. Claims 3-5 and 8-14 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The specification does not provide sufficient details to enable a skilled in the art to make and use the invention because it does not adequately describe the following:

Regarding claims 3 and 8, how to perform data transmission and the data recovery through a TDM system with irregular time intervals.

The specification does not provide enough details about the structure and operation of the elements associated with the above identified claimed features to enable one skilled in the art to make and use the invention without undue experimentation.

Other claims are rejected as the claims depending on claims 3 and 8.

2. In light of Applicant's amendment, the rejection of claims 3-5 and 8-14 under 35 U.S.C. 112, second paragraph, set in the previous Office action has been withdrawn.

*Claim Rejections - 35 USC § 103*

1. Claims 1, 2, 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishikawa (US 5,760,937) in view of Black (Black, SONET and T1, Prentice Hall, 1997, pages 92 and 93).

Ishikawa substantially teaches the limitations of the claims:

a TDM light signal channel extraction method and apparatus that separates the multiplexed signals into as many as 2 channels and extracts the channel numbers in order to provide the demultiplexed signals to the output ports of which port numbers match with the channel numbers (optical TDM demultiplexer, shown on Fig. 83 and 33:21-54, to separate the light signal in two channels, N=2, and extract the channel number in order for output ports 1 and 2; and similar four-channel system on Fig. 86, N=4), comprising:

a demultiplexing step of demultiplexing the multiplexed signals into 2 channels and providing the demultiplexed signals to as many as 2 separate ports (optical coupler 300, as shown on Fig. 83, splitting the light signal in two channels 33:21-30);

an extraction step of extracting a channel number of at least one channel in the 2 channels corresponding to said 2 separate ports (line identification data extraction circuits 314 and 316 identifying the channels per identification data 312, shown on Fig. 84 and 33:35-45);

a switching step of switching each the 2 channels to an output ports of which port numbers uniquely match with the number of the 2 channels based on relationship between the number of the at least one channel identified in the extraction step and the output port number corresponding/equal to said channel number of the one channel (signal switching circuit 320 to

match the received channels and the output ports/lines using identification data, as disclosed on 33:45-54);

and an output step of providing the signals of said switched 2 channels to the output ports of which output port numbers match with the channel numbers (outputting the channels on output lines 1 and 2 by a portion of optical receivers 306 and 307, as shown on Fig. 83, wherein the optical receivers inherently comprise outputting means, because the outputting means are essential for the outputting the channels).

Ishikawa does not teach limiting channel identification to only one channel to identify the other channels of the signal and using N channels in the system.

Black teaches a TDM structure, DS1 frame format, comprising channels, sequentially numbered from 1 to 24, as shown on Fig. 4-2(a) and described on page 92.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add limiting channel identification to only one channel in the structure of Black to identify the other channels of the signal and using N channels to the system of Ishikawa to increase speed of the switching step, because identifying one channel in the known TDM structure is sufficient for identifying all channels in the TDM structure and to improve the system operation in multi-channel environment to accommodate multiple users.

In addition, regarding claims 2 and 7, Ishikawa teaches a control step of controlling the signals of said 2 channels provided to the separate ports so that the 2 channel numbers uniquely match with the output port numbers based on the relationship between the number of the one channel identified in the extraction step and the output port number corresponding to said one channel number (alternative operation to the switching step, shown on Fig. 85 and 33:54-61,

wherein the matching between the received signals and output ports is achieved by a phase shifter 322).

2. Claims 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishikawa and Black in view of Knox (US 5,631,758).

Regarding claims 9 and 10, Ishikawa and Black substantially teach the limitations of the parent claims (see claims 6 and 7 rejection above).

Ishikawa and Black do not teach optical time-division -demultiplexing means comprising: a means for coupling the multiplexed signals and chirp light pulses; and a cross-correlating means for providing a cross-correlation signal when the multiplexed signal overlaps the chirp light pulse and converting the sequence of the N channels for multiplexed signals on the time axis into the unique sequence of channels on the wavelength axis to provide the demultiplexed signals to the N separate channels.

Knox teaches optical time-division -demultiplexing means comprising: a means for coupling the multiplexed signals and chirp light pulses; and a cross-correlating means for providing a cross-correlation signal when the multiplexed signal overlaps the chirp light pulse and converting the sequence of the N channels for multiplexed signals on the time axis into the unique sequence of channels on the wavelength axis to provide the demultiplexed signals to the N separate channels (chirping procedure, shown on Fig. 4 and 6:27-55, wherein means of the system elements 202, 206 and 207 provide coupling for multiplexed signals 205 and chirped pulses and perform cross-correlating process to generate sequence of channels, as shown on Fig. 2 and 5:30-49).

Regarding claim 11, Knox teaches coupling means that provide different delays, as shown on Fig. 4 and 6:27-55.

Regarding claims 10 and 12, Knox teaches a cross-correlated process implementation using a fiber, as shown on Fig. 2 and 4:47-65 or other means, shown on Fig. 13 and 8:64-9:56.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to means for coupling and means for cross-correlation of Knox to the system of Ishikawa and Black to improve the system operation with multiple channels by utilizing a chirping method.

3. Claims 3, 4, 8 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishikawa in view of Black in further view of Kumar (US 7,027,735).

Ishikawa and Black substantially teach the limitations of the claims (see claims 1, 2, 6 and 7 rejections above), including Black teaching TDM structure with channels delayed as shown on Fig. 4-2(a).

Ishikawa and Black do not teach using irregular-intervals TDM light signals.

Regarding claims 3 and 8, Kumar teaches using irregular-intervals TDM signals as serial data sequence with sequential bit slot delay variations to improve suppressing intra-channel four-wave mixing, as disclosed on 1:15-67.

Regarding claims 4 and 13, Kumar teaches using pulses with width  $T/N$ , which is less than  $T$ , comprising irregular/unequal delay, as shown on time diagrams of Fig. 5-8 and 2:1-24.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add using irregular-intervals TDM signals of Kumar to the system of Ishikawa and Black to improve the system operation by reducing the system jitter from the ghost pulses.

***Response to Arguments***

4. Applicant's arguments filed 8/02/07 have been fully considered but they are not persuasive.

On pages 9 and 10 of the Response, Applicant argues that specification provides adequate description on TDM system performing data transmission and data recovery with irregular time intervals.

Examiner respectfully disagrees.

The cited portions of the disclosure does not describe how the demodulation/receiving side is informed on the timing of irregular channels, as the disclosure provide no information on informing the receiving side on the irregular transmission timing of the channels, as repetition frequency and number of channels are not sufficient for the recovery of the transmitted information.

Receiving side of the system, utilizing irregular TDM, has to know the time intervals dedicated to each of the channels to recover the transmitted information.

Therefore, the receiving side cannot separate the received channels without knowledge of the irregular timing, used at the transmission side, and cannot recover the transmitted data.



On pages 10 and 11 of the Response, Applicant argues that Black teaching of a control bit in T1 structure is incompatible with the disclosed optical system.

Examiner respectfully disagrees.

Examiner did not use control bit of Black in the rejection of the claims (see the rejections above).

Examiner based the rejection on the structure of the channels (T1) in the frame of Black, wherein the channels are sequentially numbered and identification of one channel, for example channel 1, is sufficient for identifying any of 24 channels of the structure.

Ishikawa, not Black, teaches how to identify a channel on the receiving side of the system, as indicated in the claims rejections above.

### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dmitry Levitan whose telephone number is (571) 272-3093. The examiner can normally be reached on 8:30 to 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynn Feild can be reached on (571) 272-2092. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

A handwritten signature in black ink, appearing to be 'DL' followed by a stylized, cursive signature.

Dmitry Levitan  
Primary Examiner  
Art Unit 2616

**DMITRY LEVITAN  
PRIMARY EXAMINER**